

The following white paper examines the challenges that digital subscriber line (DSL) service providers face in rolling out and maintaining DSL services. It also describes their resulting operational support system (OSS) requirements. The paper then outlines the key criteria for evaluating OSS products and vendors to ensure that DSL providers select an OSS solution that will satisfy their specific immediate and future needs. While choosing the right OSS is a crucial decision for service providers, it is especially so for DSL providers who have among their operational challenges more complex service order and provisioning processes, more stringent operational efficiency constraints, and more demanding inventory management needs than traditional telcos.

We would be pleased to receive any feedback about this paper. Please send your comments or questions to info@eftia.com.

Choosing the Best OSS is Key to DSL Service Providers' Success

The digital subscriber line (DSL) market is developing at an extraordinary rate, spurring new entrants and established providers alike to rapidly and continuously adapt. To outpace competing providers and technologies, DSL providers must satisfy customer demands for innovative, reliable and inexpensive services. In addition to facing this challenge, DSL providers are tasked with complex provisioning and maintenance processes, which will become even more difficult as the market expands, consumer expectations increase and competition intensifies. As a result, it is crucial that DSL providers choose an operational support system (OSS) vendor that understands the intricacies of their business and offers a flexible, scalable solution designed specifically for them.

Current Challenges in Provisioning DSL

DSL services entail a complex, multilayered service model that encompasses

- Many different types of technologies and related physical assets, such as customer premise equipment (CPE), digital subscriber line access multiplexers (DSLAM), asynchronous transfer mode (ATM) switches, Internet protocol (IP) routers, and cross-connect panels and switches
- Access loops that must meet stringent transmission parameters
- Core network broadband transport facilities (DS-3, OC-n, etc)
- Virtual circuits, such as ATM or frame relay permanent virtual circuits (PVC)
- IP and basic and advanced IP services, such as Internet access, Web hosting, E-mail, voice over IP (VoIP) and conferencing

Consequently, rolling out and maintaining DSL services can be a complex, costly and labor intensive endeavor. The related operations processes require a sophisticated OSS that must be able to effectively and efficiently model and manage the various layers of this service model and the relationships between them.

Operational challenges facing DSL service providers include

- Performing loop qualification
- Installing CPE and managing the inventory
- Executing remote configuration and testing
- Deploying DSLAM equipment colocated with incumbent local exchange carrier (ILEC) equipment
- Managing network capacity and related assets
- Interacting with trading partners
- Managing service level agreements (SLA)
- Integrating voice and data services on the same line
- Reducing service intervals
- Operating within stringent cost constraints

Given the capital outlay required to sign up customers, DSL providers are especially motivated to optimize the use of their capital assets and to avoid churn—a difficult proposition at times, considering the potential for frustrating delays in hooking up and maintaining the service. Customers have also complained of long waits for technical support, confusing billing and regular outages. In fact, some industry analysts estimate that the capital cost of taking care of the DSL network is less than 20%, while the bulk of the expense is for operational support, which includes customer care and tech support.

Market Challenges in Providing DSL Services

In addition to the immediate challenges that DSL providers face, there are several long-term factors on the horizon that could substantially impact their revenue projections. These include

- **Fixed market space**

Several other high-speed access technologies (cable modems, wireless technology and satellite technologies) compete with DSL-based services for the same market space. While forecasts for DSL market growth are very optimistic, unanticipated factors may result in one or more of these technologies restricting DSL's share of the broadband market.



- **Intense competition**

To be competitive in a market that sees new entrants weekly, DSL providers are compelled to create differentiating service bundles and offer innovative value-added services that leverage the DSL infrastructure. This necessity further increases the complexity of provisioning DSL services while driving down revenues. As a result, revenues may decrease as expenses increase.

- **Regulation of the communications industry**

Future regulations established by the Federal Communications Commission (FCC) and standards adopted by international regulatory bodies will undoubtedly affect the DSL market, perhaps in unexpectedly detrimental ways.

Market Opportunity

Despite the challenges of providing DSL service, a rapidly growing number of providers are seeking to capture a share of what they anticipate will be a lucrative market. The consumer demand for high-bandwidth services, originally sparked by a desire for high-speed Internet access, is being fueled by an interest in E-commerce applications and cutting-edge services, such as interactive gaming, video conferencing, VoIP and virtual private networks (VPN).

Many consumers can already comparison shop among a variety of DSL providers in their area. Most large cities in the United States, for instance, have at least four DSL service providers up and running, and many will have six or more by the end of this year. Some estimates indicate that there will be as many as two million DSL lines ready to provide broadband service across the United States by December 2000. If so, there would be as many DSL lines in service as there would be homes connected to the Internet via cable modem access in the United States (Fusco 2000). The Pelorus Group predicts that, despite intense competition from other technologies, DSL will continue to make dramatic inroads in the broadband market, both in the United States and around the world. In fact, the International Data Corporation concludes that revenues for DSL services in the United States could top \$2 billion by 2003 (CLEC-Planet.com 1999), and the Pelorus Group projects that worldwide equipment revenues alone will surge to \$1.2 billion by 2004 (ISP-Planet.com 1999).

The OSS Solution

DSL providers are searching for an edge that will allow them to take advantage of the tremendous opportunities while negotiating the daunting challenges posed by the DSL market. Choosing a superior OSS is proving to be a critical step in creating the differentiated service offerings necessary to outpace the competition. The right OSS—one that is easily deployable, adaptable, scalable and architecturally robust—enables DSL providers to quickly and cost-effectively implement new services and technologies, adapt to rapidly changing market needs and provide consistently excellent customer service.



While the immediate concern of DSL providers is to determine whether the OSS has the underlying architecture and integrated solutions to support the dynamic service requirements of DSL provisioning, they are equally interested in assessing the OSS's capacity to grow with their businesses, their service base, the technology and the marketplace. DSL providers need to be certain that the OSS solution is flexible and scalable in order to

- Meet the changing requirements of provisioning the physical and logical layers of an end-to-end connection
- Deliver a wide range of seamlessly bundled services
- Adapt to the changing requirements of DSL providers' businesses as they enter new regions and offer new services and service bundles to new types of customers
- Handle the growing complexities of the DSL marketplace
- Enable the cost-effective provisioning of high-volume services

In short, DSL providers are concerned not only with gaining the advantages associated with a fully featured service management solution, but also with securing the services of an OSS vendor that designs for change in anticipation of the shifting challenges of provisioning DSL services.

Product Criteria

To be certain that an OSS solution has been designed with their specific requirements in mind, DSL providers should look for the following features in the OSS vendor's product, or in their product development goals:

- Support for on-line (real time) loop qualification via access to a loop qualification database, either internal or external to the DSL service provider
- Streamlined service provisioning to increase operational efficiency and minimize service provisioning intervals of DSL services
- Streamlined trading partner interconnection tailored to the needs of the DSL service provider. This encompasses pre-order, line service request (LSR), access service request (ASR) and electronic trouble bonding.
- Effective CPE inventory management support
- Support for service level agreement management
- Support for an application service provider (ASP) or service bureau model that would allow the OSS to be hosted and administered by a third party. This capacity is particularly appealing to new entrants who want to achieve quick time to market with low initial capital expenditure.
- Modular products with external interfaces that enable quick integration with external systems (customer relationship management, sales automation, billing, service activation, network management and performance management) to provide an end-to-end business solution



- Business process support specific to business needs
- Superior asset and circuit inventory and capacity management to handle the complications that DSL creates in inventory management with its proliferation of modems, ports, circuit cards, network cards, routers and IP addresses. It is imperative that the inventory management feature can scale with DSL providers as they add more subscribers and diversify their services.
- Support for a customer care Web interface that will empower subscribers to perform many customer service tasks, including service ordering, upgrading and cancelation; bill payment and monitoring; and ticket tracking for repair and maintenance. This feature increases operational efficiency and decreases customer support expenditures.

Benefits of a Superior OSS Solution

A superior OSS solution offers benefits that affect numerous aspects of DSL provisioning:

- Increased operational efficiency and service assurance to lower operating costs in a highly competitive industry
- Integrated order management, inventory management and maintenance capability to support a multi-vendor environment, a complex infrastructure, and a wide range of DSL, broadband, IP and voice services
- Loop qualification and loop acquisition through seamless interaction with trading partners, such as ILECs
- CPE inventory management
- Service bundling
- Improved time to market for faster realization of revenue
- Enhanced quality of customer service
- Integration of best-of-breed applications for billing, service activation and network management

Vendor Criteria

When selecting an OSS vendor, DSL providers should look for attributes that validate the vendor's viability and quality. Name recognition and customer references are one way to appraise the vendor; however, DSL providers acknowledge that the OSS solutions they are seeking are innovative and that most of the vendors offering them have themselves only recently begun operation. For this reason, it is usually more indicative to assess several critical vendor attributes:

- Ability to meet implementation goals: DSL providers recognize that installation takes approximately one month and that configuration and customization can take an additional three to six months. However, they should choose an OSS vendor that can get them up and running within three to four months.



- Long-term viability: DSL providers must be confident that the OSS vendor will be available to meet future build-out, upgrade and maintenance needs. Providers should assess vendor size, past growth patterns, and its management team, in addition to analyzing financial statements, capitalization and fundraising success.
- Future vision: DSL providers seek a long-term relationship with an OSS vendor and should, therefore, be certain that the OSS solution's upgrades and future developments are in tune with their own objectives and direction.
- Partnerships: DSL providers should note strong allegiances between the OSS vendor and systems integrators, technology partners, DSL wholesalers, etc. Such allegiances validate the vendor's credentials and offer potential benefits to providers, including ease of implementation and integration, improved provisioning, and reduced costs.

Conclusion

To compete successfully in today's intensely competitive communications marketplace, DSL providers must deliver on their promise to provide fast, reliable, secure and economical services to their customers. Because of the complexities inherent in rolling out DSL, it is imperative that providers focus on their core delivery and transport systems. To do so, they must be confident that their OSS will continue to accurately and efficiently provision, bill and support their services. Since a superior OSS is designed to make every aspect of DSL service ordering, provisioning, maintenance and customer care operate smoothly and cost effectively, its selection is one of the most important decisions a provider will make. By choosing an OSS solution based on key product and vendor criteria, DSL providers will be fully prepared for peak performance in the marketplace—today and in the future.

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